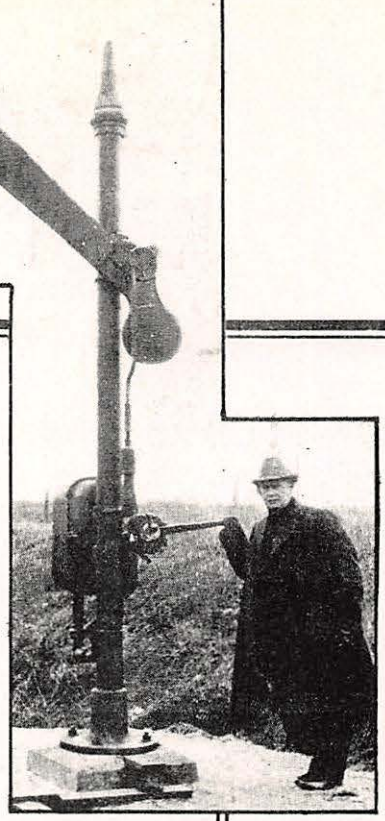


Style "T-2"
D.C. Low Voltage

Smashboard Signal

Power Driven to both Danger and Clear Positions

S·I·S·
No. 159

Union Switch & Signal Co.
Swissvale, Pa.

Union Switch & Signal Co.

SWISSVALE, PA.

Subject Style "T-2" D.C.Low Voltage Smashboard Signal, Power Driven to Clear and Danger Positions. See S.I.S. #160 for Automatic Interlocking	Sales Information Sheet
	Number 159
	Date July 14, 1930
	6.2 Sheets

UNION "T-2" Smashboard Signals can be supplied for either upper or lower quadrant operation of the semaphore smashboard....Both of these can be arranged for return to the danger position either by gravity or by motor operation.....The latter signal, in which the smashboard is motor-driven to both the clear and danger positions, has considerable advantage for lower quadrant operation over the gravity return type on account of the possibility of snow and ice over-balancing the return torque of the gravity type signal. .....The gravity return type of signal uses the standard "T-2" signal mechanism and requires fewer relays for its control than the motor-driven type. However, for the reason mentioned above, the power return signal is recommended...This type is described in detail on the following pages.

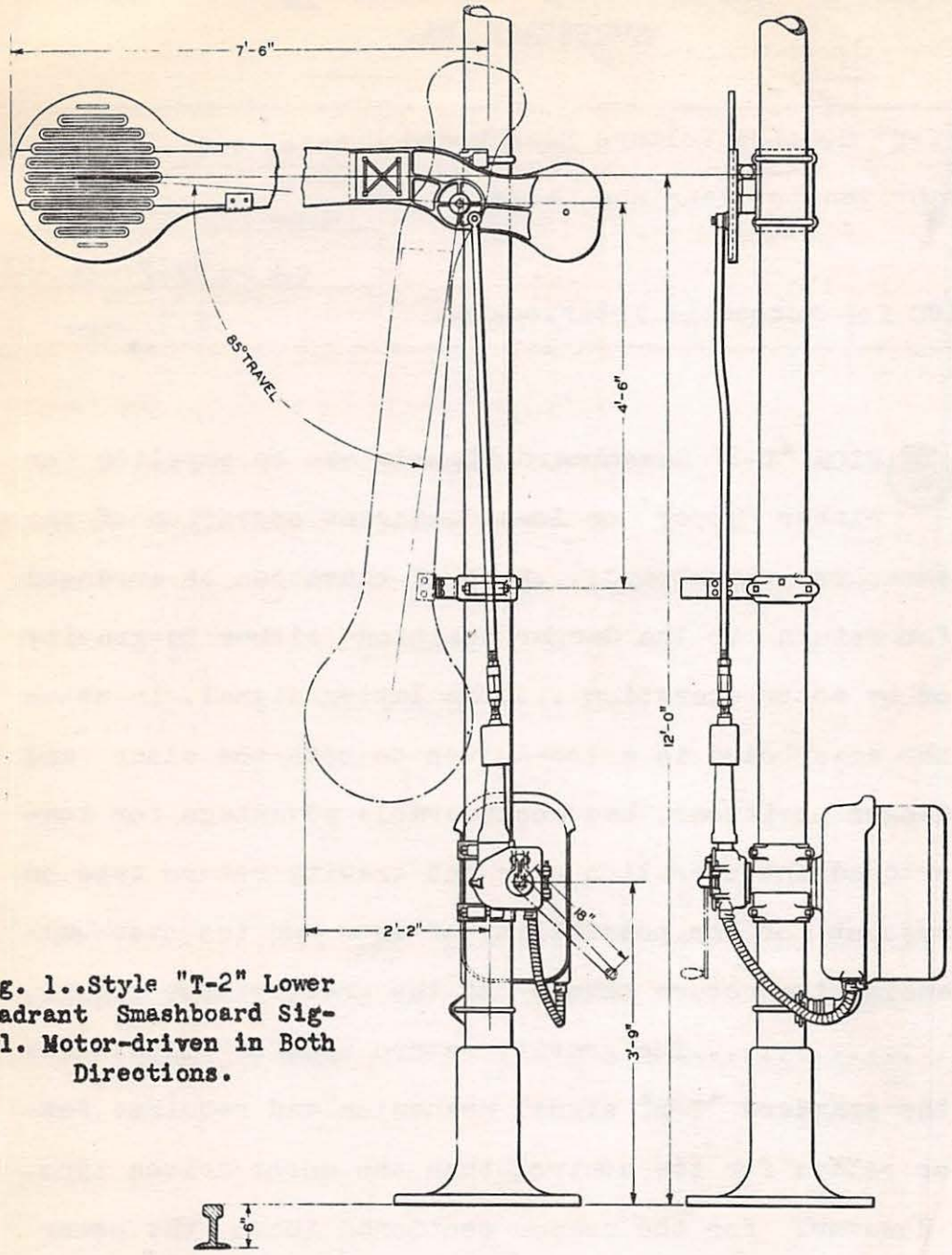


Fig. 1..Style "T-2" Lower Quadrant Smashboard Signal. Motor-driven in Both Directions.

The illustration on the front cover shows a "T-2" upper quadrant smashboard signal and Fig. 1 shows the arrangement of the parts for lower quadrant operation. The "T-2" Motor, for this application, has no ratchet device. Instead of the usual slot, it employs an electro-magnet which operates a friction brake. This brake

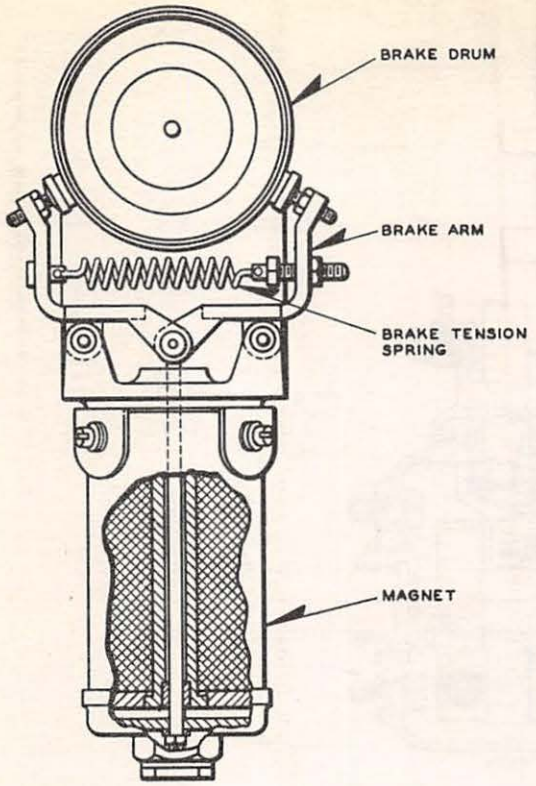
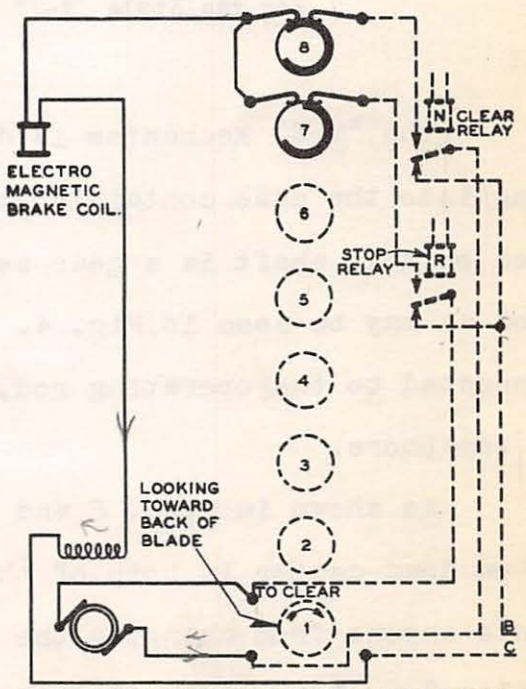


Fig. 2.....Electrically Released Friction Brake

holds the mechanism in any position, in which it may be, when power is off. As shown in Fig. 2, the two cork pads which are fastened to the brake arms are normally held against the brake drum by the brake tension spring. The pressure of these pads upon the brake drum is released when the magnet becomes energized. Since the magnet is in series with the motor, the magnet is energized only as long as the mechanism is being operated. Reference to the wiring diagram, Fig. 3, will show that when the mechanism reaches either the "danger" or "clear" positions, the motor circuit is broken and the brake is automatically applied. Two relays are required for the control of the mechanism, one to be energized for clearing and one for returning the semaphore to danger.



NOTE: CIRCUIT CONTROLLER SHAFT MOVES 3 TIMES THE SPEED OF SEMAPHORE IN OPPOSITE DIRECTION. HENCE 90° OF SEMAPHORE IS EQUIVALENT TO 270° OF MOVEMENT OF CIRCUIT CONTROLLER SEGMENT.

Fig. 3.....Wiring Diagram of Style "T-2" Smashboard Signal

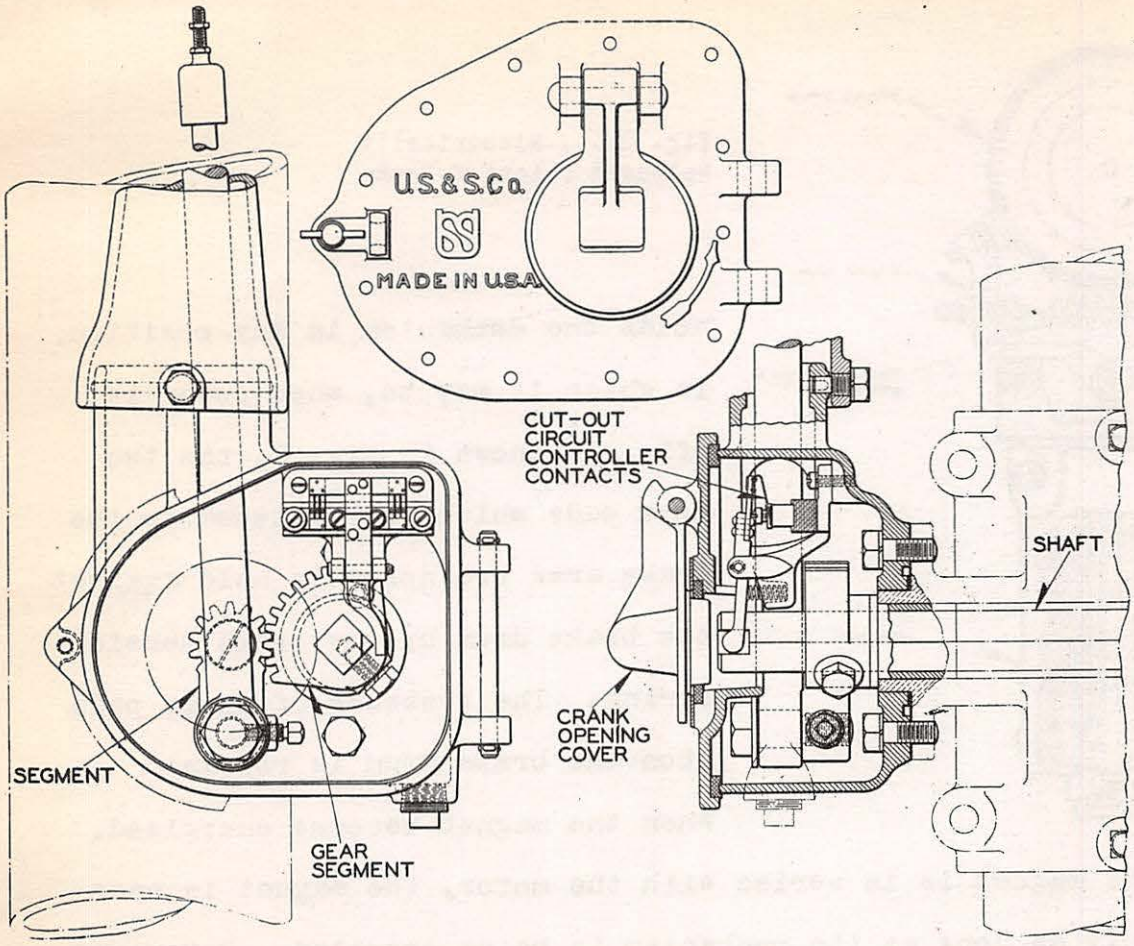


Fig. 4.....Hand Operation Mechanism for the Style "T-2" Smashboard Signal

The "T-2" Mechanism is directly connected to a shaft extending into the case containing the hand operating mechanism. Mounted on this shaft is a gear segment which meshes with a pinion segment as may be seen in Fig. 4. The arm of the pinion segment is connected to the operating rod, which in turn operates the Smashboard semaphore.

As shown in Figs. 5 and 6, the arm of the pinion segment rests on dead center in both of the two extreme positions. This prevents anyone from changing the aspect of the signal from either the "clear" or "danger" positions by exerting external force against the blade.

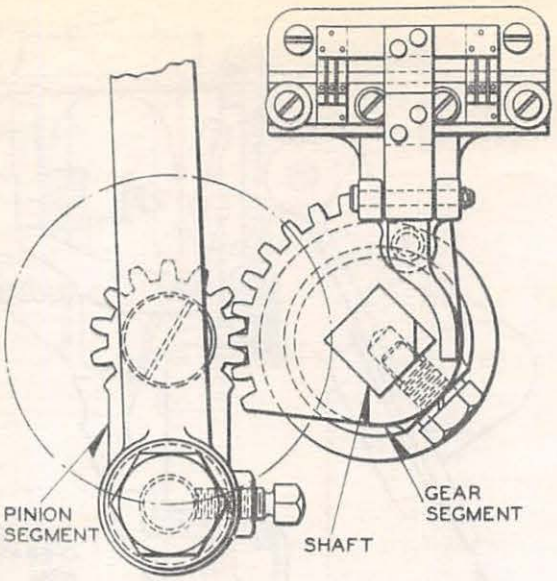


Fig. 5....DANGER Position... Dead Center Arrangement of Gears prevents clearing from Semaphore Arm

To hand operate the signal from "danger" to "clear", the hand operating lever is slipped over the end of the shaft as illustrated in Fig. 3 and rotated 90° in a counter-clockwise direction as indicated by the arrow on the case door. Figs. 7 and 8 show that the hand operating mechanism is so designed that the hand operating crank cannot be inserted in the crank opening and slipped

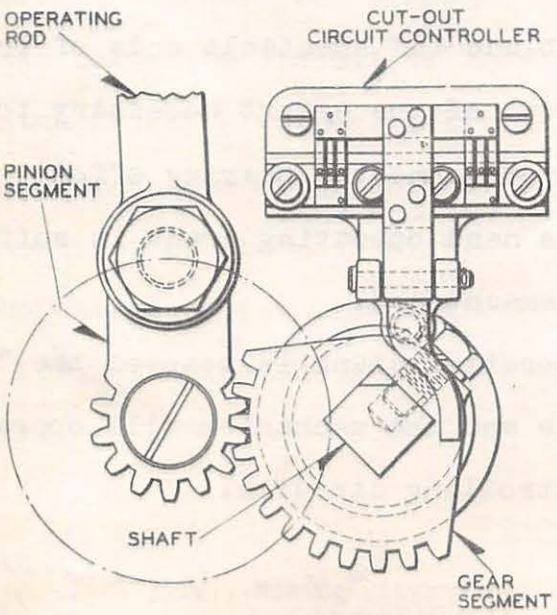


Fig. 6.....CLEAR Position... Dead Center Arrangement of Gears prevents manipulation to Danger from Semaphore Arm

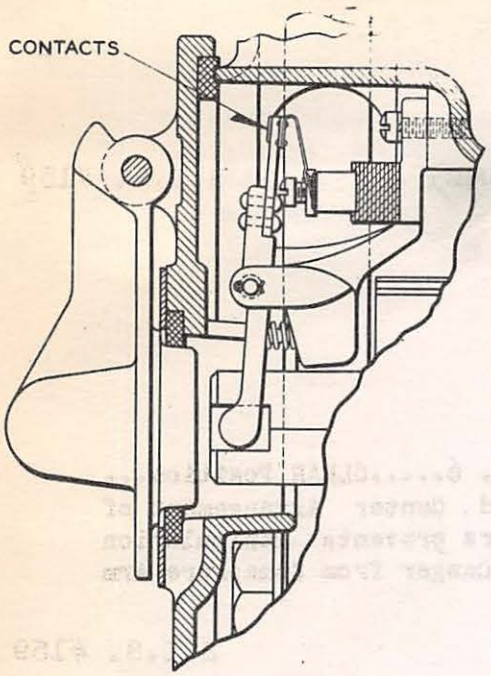


Fig. 7....."Cut-out" Circuit Controller....Contacts Closed

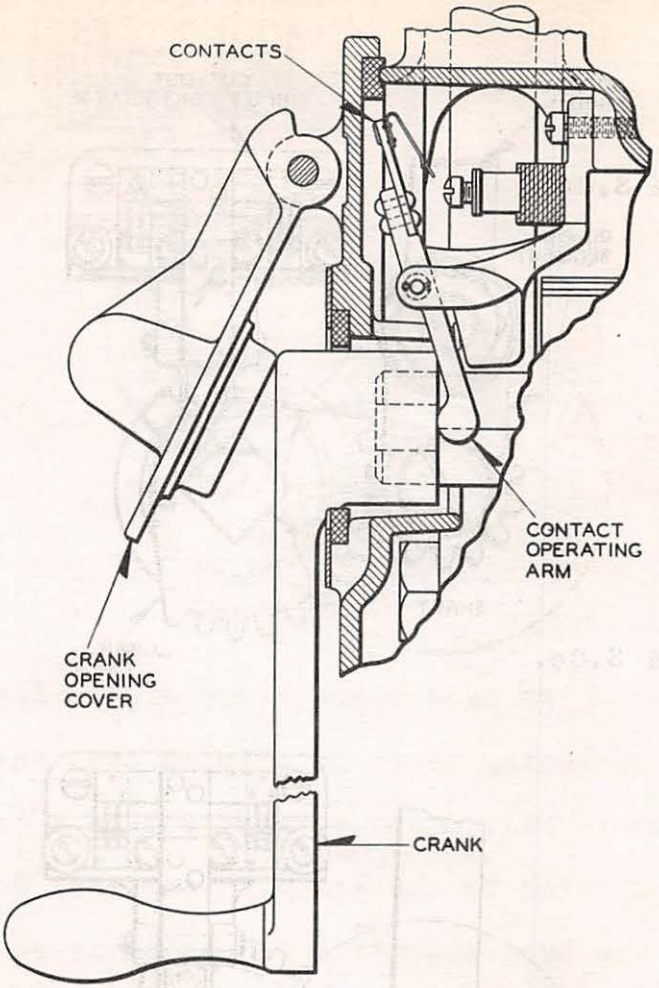


Fig. 8...Inserting the Crank for Hand Operation opens the "Cut-out" Circuit Controller Contacts.

into position on the shaft without opening the "cut-out" circuit controller contacts. Since the blade and spectacle ends of the semaphore are nearly balanced, most of the effort necessary to hand operate the signal is exerted to overcome the braking effort, but the leverage obtained through the hand operating crank is sufficient to allow ready operation of the smashboard.

As soon as the hand operating crank is removed the "cut-out" contacts automatically close and the mechanism will operate to the position governed by its controlling circuits.

H. N. Goodwillie
1/14/30